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APPLICATION NUMBER: ***60/425,848***
FILING DATE: ***November 12, 2002***

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Certifying Officer

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PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 CFR 1.53(b)(2).

Docket Number		Type a plus sign (+) inside this box ☐	+
US020443P			

INVENTOR(s)/ APPLICANT(s)			
LAST NAME	FIRST NAME	MIDDLE INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY)
Sato Toguchi	Takashi Kazunobu		Scarborough, New York New York, New York

TITLE OF THE INVENTION (280 characters max)
A Method for Efficient TIMEOUT Message Management

CORRESPONDENCE ADDRESS					
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STATE	New York	ZIP CODE	10591	COUNTRY	U.S.A.

ENCLOSED APPLICATION PARTS (check all that apply)				
X	Specification Number of Pages	4	☐	Small Entity Statement
☐	Drawing(s) Number of Sheets	0	☐	Other (specify)

METHOD OF PAYMENT (check one)			
☐	A check or money order is enclosed to cover the Provisional filing fees	PROVISIONAL FILING FEE AMOUNT ($)	$160.00
X	Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: 14-1270		

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

[X] No

[ ] Yes, the name of the U.S. Government agency and the Government contract number are:

Respectfully submitted,

SIGNATURE: _____ Date: 11/12/02

TYPED or PRINTED NAME: DANIEL J. PIOTROWSKI
REGISTRATION NO.: 42,079

[ ] Additional inventors are being named on separately numbered sheets attached hereto

CERTIFICATE OF EXPRESS MAILING

Express Mail Mailing Label No. EL827840765

Date of Deposit November 12, 2002

I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Noemi Chapa
Typed Name

Noemi Chapa
Signature

3. GOVERNMENT CONTRACT INVENTION

Was the invention made under a government contract? ☐ Yes ☒ No

4. PLEASE PROVIDE A TWO OR THREE SENTENCE SUMMARY OF YOUR INVENTION an include and underline KEY WORDS which might be useful in searching for relevant patents o publications:

By storing remote timeout information when a TIMEOUT message passes through the bridge fc the first time, and using the stored information to synthesize a TIMEOUT response message fc successive TIMEOUT request messages, eliminate the need to forward TIMEOUT reques messages further, and reduce the message traffic and improve the efficiency of the net. Other ke words: 1394, 1394.1, Bridging.

5. PRESENT STATE OF THE ART

Briefly describe the closest already-known technology that relates to the invention. This woul include, for example, already existing products, methods or compositions which are known to yo personally or through descriptions in publications.

This invention addresses the same problem described in the disclosure "An efficient TIMEOU message management in IEEE 1394 bridge environment" by Toguchi and Sato, which was file on January 17, 2001. According to the draft standard IEEE P1394.1 Draft 1.0, the TIMEOU message needs to be processed by each bridge along the way from the source bus to th destination bus to accumulate the timeout value each time the TIMEOUT request message i initiated.

The previous disclosure "An efficient TIMEOUT ..." provides a means to improve the efficiency c this TIMEOUT message management by the following method. 1) The entry portal on the sourc bus intercepts the initial TIMEOUT response message for a particular destination bus and store its timeout value. 2) For successive TIMEOUT request messages for the same destination bus the entry portal on the source bus (or an intermediate bus) synthesizes the correspondin TIMEOUT response message using the stored remote timeout value without further forwardin the TIMEOUT request message toward the destination bus, thus reducing the traffic on the ne

6. ADVANCEMENT IN STATE OF THE ART

Briefly describe the unique advancement achieved by the invention. This may be done, fo example, by describing a problem with the prior art that is solved or specific objects that ar achieved by the invention.

Problem:

The previous invention allows storing of TIMEOUT values only at the entry portal on the sourc bus. For instance, even if there are ten bridges between the source bus and the destination bus only up to one bridge (on the source bus) can store the timeout value for future use.

Advancements:

This invention allows all bridges along the way between the source bus and the destination bu to store the timeout value to the destination bus from its local bus in one shot. For instance, there are ten bridges between the source bus and the destination bus, up to ten bridges can stor the appropriate timeout value for a single TIMEOUT message for future use. This method is fa

more efficient than the previous invention.

7. WHAT IS THE BEST WAY YOU KNOW OF TO IMPLEMENT THE INVENTION?
Briefly describe the invention and how it achieves the advancement described in paragraph 7.

A1) When an entry portal receives a TIMEOUT request message, it checks its storage (e.g., the valid_flag for the destination bus) whether the remote_timeout value from its local bus to the destination bus is already known.

In the case that the entry portal's co-portal is the exit portal on the destination bus, it shall know the remote_timeout, max_remote_payload, and hop_count values for the destination bus. For instance, the remote_timeout value is the sum of the SPLIT_TIMEOUT register value of its co-portal and the bridge's internal maximum forwarding time for both request and response subactions. The max_remote_payload value is the maximum payload size that can go through the bridge, and the hop_count value is always one in this case. All these values can re pre-stored by the entry portal together with the valid_flag for the destination bus set to one.

A2) If the remote_timeout value is already known (e.g., valid_flag = 1), it synthesizes a TIMEOUT response message by adding the known remote_timeout value from its local bus to the destination bus to the remote_timeout value in the TIMEOUT request message. It also compares the known max_remote_payload value for the destination from its local bus with the max_remote_payload value in the request message, and uses the smaller of the two as the max_remote_payload value of the response message. It also adds the known hop_count to the destination bus from its local bus to the hop_count value in the request message and uses the sum as the hop_count value in the response message.

Otherwise (e.g., valid_flag = 0), it will performs the following procedure:

A3a) temporarily store (To, Po, Co) for the destination bus with the valid_flag cleared

where To is the remote_timeout value, Po is the max_remote_payload value, and Co is the hop_count value; all in the received TIMEOUT request message.

A3b) forward (To+Tx, Px, Co + 1) toward the destination bus

where Tx is the sum of the maximum forward time for request subactions (from the entry portal to the entry portal of the next bridge) and the maximum forward time for response subactions (from its co-portal (i.e., the entry portal for response subactions) to either the entry portal of the next bridge (from the perspective of response subactions) or the requester node),

and Px is the maximum data payload that can be forwarded from the entry portal to the entry portal of the next bridge

A3c) intercept the corresponding TIMEOUT response message and store (Ty – To, Py, Cy – C for future use with the valid_flag set, and forward (Ty, min(Py, Po), Cy) toward the source bu

where Ty is the remote_timeout value, Py is the max_remote_payload value, Cy is the hop_co value; all in the received TIMEOUT response message.

Alternatively, following procedure can be used to produce the same result:

B1) same as A1)
B2) same as A2)
B3a) same as A3a)
B3b) forward (To + Tx, 0xFFFF, Co + 1) where 0xFFFF is the maximum value for the max_remote_payload field
B3c) store (Ty – To, min(Py, Px), Cy – Co) with the valid_flag set, and forward (Ty, min(Py, Px, Po), Cy)

The above-discussed procedures provide significant efficiency improvement over the previous invention without requiring changes to the draft standard. This scheme works even if there are both legacy bridges (i.e., bridges based on the draft standard) and these enhanced bridges mixed on the net.

However, further improvement and simplification are possible if changes to the draft standard are allowed and all the bridges follow the same rules as described bellow:

C1) Each entry portal checks the destination of a received TIMEOUT request message and see whether the remote_timeout value for the destination is already known by looking at its storage (e.g, the valid_flag for the destination bus).

In the case that the entry portal's co-portal is the exit portal on the destination bus, it shall know the remote_timeout, max_remote_payload, and hop_count values for the destination bus. For instance, the remote_timeout value is the sum of the SPLIT_TIMEOUT register value of its co-portal and the bridge's internal maximum forwarding time for both request and response subactions. The max_remote_payload value is the maximum payload size that can go through the bridge, and the hop_count value is always one in this case. All these values can re pre-stored by the entry portal together with the valid_flag for the destination bus set to one.

C2) If it is known (e.g., valid_flag = 1), it generates the corresponding TIMEOUT response message by inserting the stored remote_timeout, max_remote_payload, and hop_count values.

C3a) Otherwise (e.g., valid_flag = 0), it forwards the TIMEOUT request message toward the destination without modifying the message. The value of each field in the message shall be (0, 0xFFFF, 0) as initialized by the requester by definition.

C3b) If an exit portal (from the perspective of response subactions) receives a TIMEOUT response massage, it updates the remote_timeout, max_remote_payload, and hop_count values according to the formulas below, stores them for the destination bus for future use with the valid_flag set, and forwards the response message toward the source bus:

Store (Ty + Tx, min(Py, Px), Cy + 1) with the valid_flag set, and forward (Ty + Tx, min(Py, Px), Cy + 1)

where Tx and Px are defined in A3b) and Ty, Py, and Cy are remote_timeout, max_remote_payload, and hop_count values in the received TIMEOUT response message.

For all of the above-discussed procedures, a table with entries each consisting of remote_timeout

field, max_remote_payload field, hop_count field and valid_flag can be used to store both temporary and final remote timeout parameters for each destination bus. The table entries shall be cleared upon net-topology change.

The last method discussed is the simplest and the most efficient solution, and will be proposed to the IEEE P1394.1 working group or BRC (Ballot Response Committee) to be incorporated into the IEEE 1394.1 standard.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

TAKASI SATO ET AL

Serial No.

Filed: CONCURRENTLY

Title: A METHOD FOR EFFICIENT TIMEOUT MESSAGE MANAGEMENT

Atty. Docket

US020443P

Commissioner for Patents Washington, D.C. 20231

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all prior appointments (if any) of Associate Attorney(s) or Agent(s) in the above-captioned case and appoints:

DANIEL J. PIOTROWSKI **(Registration No. 42,079)**

c/o U.S. PHILIPS CORPORATION, Intellectual Property Department, 580 White Plains Road, Tarrytown, New York 10591, his Associate Attorney(s)/Agent(s) with all the usual powers to prosecute the above-identified application and any division or continuation thereof, to make alterations and amendments therein, and to transact all business in the Patent and Trademark Office connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED ATTORNEY OF RECORD.

Respectfully,

Michael E. Marion, Reg. 32,266
Attorney of Record

Dated at Tarrytown, New York
this 12th day of November, 2002.